National Institute on Drug Abuse

Atypical Inhibitors of Monoamine Transporters; Method of Making; and Use Thereof

Summary (1024-character limit)

The technology is a series of modafinil analogues that bind with moderate to high affinity to the dopamine (DA) transporter (DAT). Some compounds also have affinity for the serotonin (5-HT) transporter (SERT) and/or sigma-1 receptor. The compounds retain the desired dopamine transporter affinity with greater metabolic stability over previously described unsubstituted piperazine ring analogues. Importantly, these compounds have no predicted addictive liability. Also disclosed are methods for treating substance use disorders as well as other neuropsychiatric disorders such as ADHD, depression, narcolepsy, and cognitive impairment. Researchers at the National Institute on Drug Abuse (NIDA) seek licensing and/or co-development research collaborations for further development and commercialization of the compounds.

NIH Reference Number

E-005-2018

Product Type

- Therapeutics

Keywords

- Substance use disorder, ADHD, sleep disorders, dopamine reuptake inhibitor, Newman

Collaboration Opportunity

This invention is available for licensing and co-development.

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Description of Technology

Substance use disorder is a chronic medical condition, taking its toll on our public health care and judicial systems in an economically unsustainable way. More than 20 million Americans suffer from substance use disorders. Certainly, the development of prevention and treatment options as alternatives to incarceration is the appropriate and ethical solution to this escalating global problem. Although the recent opioid epidemic has redefined public perception of drug dependence, addiction is not a single illness for which one treatment modality will cure all. Efforts to develop medications to treat this family

of disorders must be tailored to the specific substance or substances of abuse, co-morbidities with other neuropsychiatric illnesses, and ultimately individual treatment needs, which significantly increases the challenge.

The development of medications to treat cocaine and methamphetamine use disorders has been unsuccessful, leaving this patient population without pharmacotherapeutic options. As the dopamine transporter (DAT) plays a prominent role in the reinforcing effects of these psychostimulant drugs that can lead to addiction, atypical DAT inhibitors have been developed that prevent cocaine or methamphetamine from binding to DAT, but they themselves do not display the psychostimulant or rewarding properties that would predict their addictive liability.

Potential Commercial Applications

- Treatment of substance use disorders
- Treatment of ADHD
- Treatment of depression
- Treatment of narcolepsy
- Treatment of cognitive impairment

Competitive Advantages

- There are currently no FDA approved medications to treat cocaine and/or methamphetamine use disorders
- Compounds do not produce psychostimulant-like behavioral effects and attenuate behaviors induced by cocaine and/or methamphetamine
- Mild elevation of brain dopamine and serotonin levels
- Analogues have potentially lower effective doses
- Potentially bioavailability than modafinil
- Potentially improved water solubility over modafinil

Inventor(s)

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Development Stage

- Pre-clinical (in vivo)

Publications

Giancola JB, et al. Discovery of novel DAT inhibitors based on the modafinil scaffold for the treatment of psychostimulant abuse. Poster at: the Soc. For Neurosciences meeting, Nov. 14, 2017, Washington D.C.

Patent Status

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/585,058 , Filed 13 Nov 2017

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Related Technologies

- E-073-2013 - Analogues of Modafinil for treating sleep and attention disorders